REMARKS

The present amendment is submitted in an earnest effort to advance this case to issue without delay.

This amendment is a substitute amendment in response to the office communication of 28 October 2003 to present the claims in ascending numreical order.

1. The priority claim acknowledgement in paragraph 13 of PTO-326 is appreciated.

2. Pursuant to the Examiner's suggestion, a new title directed to the method and detailing the invention is provided herewith.

3. The new abstract required by the Examiner and directed to the method has been supplied.

4. Claims 1 and 19 have been amended to clarify the fact that the high energy beam is an electron beam and claim 6 has been cancelled as superfluous.

Claim 7 has been made directly dependent upon claim 1.

5. Claims 1 to 7 and 19 have been rejected under 35 USC 112, second paragraph as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The terms "high" and "low" have been challenged by the Examiner as being relative terms. However, the case law makes

clear that relative terms are not a problem at all. Such terms are perfectly definite when the term is meaningful to persons skilled in the art, say Ex parte Miller, 18 USPQ 216; Ex parte Brownell, 33 USPQ 242; and Ex parte Glover et al, 42 USPQ 636 and the host of cases following these which essentially say the same thing.

There are enclosed a number of publications derived from the internet and which support this position. For example, an enclosure A attached hereto is entitled, "Dynamics of surface chemical reactions induced by low-energy electrons: oxidation of hydrogen passivated Si by H_20". This article clearly demonstrates that "low energy electrons" is a term of art.

Enclosure B is entitled "Uniformity of High-Energy Electron-Beam Calibrations" demonstrating that "high energy electron beam" is a term of art.

Enclosure C is entitled "High-pressure nanolithography using low-energy electrons from a scanning tunnelling microscope".

Enclosure D is entitled "Energy deposition by low energy electrons in Ar and other gases".

Enclosure E is entitled "Stochastic Acceleration of Low Energy Electrons in Plasma with Finite Temperature".

Enclosure F is entitled "Holography with Low Energy Electrons: Principles and Applications".

From the foregoing, it will be apparent that the rejection under 35 USC 112, second paragraph based upon the user of the terms "high" and "low" is misplaced and should be withdrawn.

With respect to the objection to claim 1, line 22 under 35 USC 112, note in FIG. 2 the low energy electron beam source at 1 which is in addition to the high energy electron beam source 2.

6. The rejection of the claims as amended on Morton cannot stand.

The Morton reference has been applied to show that indeed everything in the admitted prior art of FIG. 1 is known and that is all that Morton discloses. The Examiner recognizes that Morton does not have a self bias and critical to the invention is the provision of a radio frequency or pulsed direct current plasma ahead of the substrate so that the surface of the substrate is bombarded with particles from the radio frequency or pulsed direct current plasma. The Examiner has referred to the radio frequency field at the substrate surface and more precisely Morton states at column 2, lines 38 to 60: "Briefly stated the optical thin film deposition system of the present invention comprises a vacuum chamber, substrate support and movement means for improving deposition uniformity, thermal and electron beam means for vaporizing solid materials, substrate heating means, inlet and outlet baffles for providing a laminar gas flow across the surface of substrates, and an antenna for providing an RF field at the substrate surface. The evaporative sources are used to deposit thin films of the solid materials being vaporized or to provide gases for reaction with other gases in a RPD or CVD process. The baffles are used to provide a flow of reactive gases across the substrate surface for RPD and CVD processes, but do not interfere

with evaporative deposition. The RF antenna is used to generate a RF field at the substrate surface for RPD. Substrate heaters are used to provide high substrate temperature required for CVD and to provide optimum substrate temperatures for evaporative deposition and RPD. Reactive plasma cleaning is used prior to any sequence of depositions and depositions are performed in any sequence without breaking vacuum or removing substrates from the chamber."

There is no teaching here of the radio frequency or pulsed direct current plasma with the effect of bombardment of the substrate.

That eliminates any residue optical absorption to allow the density of the deposited layer to be increased over the prior art.

The Morton reference, therefore, does not teach or suggest the claimed invention.

Applicant believes that the following statement may be helpful:

"Maybe it is useful to remember that the family of Ion Plating processes (invented by Mattox in the 1964) is generally constituted by a configuration in which is created a plasma in front of the substrates that energize a percentage of condensing particles (by ionizing it and than accelerated by the substrate bias) and/or by bombarding the growing film with ionized particles.

The USA patent 4,619,748 (of the firm Balzers) was an evolution of the previous Ion Plating configuration, in which the ionization of condensing particles is obtained by bombarding the evaporating material (heated by an electron gun) with a beam of low

energy (around 60-80 eV) and by using the self-bias of the substrate induced by the ionized particles of the condensing material and tie process atmosphere.

Our invention is a further improvement of this patent based on the introduction of a R.F. (or D.C. pulsed) plasma in front of the substrates, with the scope to eliminate the residual optical absorption (always present by using previous configuration), to increase the density of the deposited layer and also to make possible an higher deposition rate, by enhancing the reactivity of the process atmosphere.

In more details as far as regarding the U.S. patent 4,058,638, this patent describes a conventional Ion Plating plasma assisted process, using traditional thermal source (emitting non ionized particles) and generic CVD system. In the process proposed by our invention the most important effects induced by the plasma surrounding the substrates are to enhance the reactivity of the process atmosphere to obtain absorption free optical coatings (by recovering the dissociation induced by the energetic bombardment up to 60-80 eV), to energize the condensing ionized particles and to introduce a controlled ion bombardment of the growing film. Regarding the United States Patent 6,315,873, this patent describes a traditional Reactive Sputtering configuration with the introduction of fluorinate gases near to the substrates to deposit fluorite materials starting from metal. In this case this technique is not even an Ion Plating process and than very different from our invention.

Regarding the USA patent 6,045,671 this is just a masking process to define structures using a vacuum deposition process, than completely different from our invention.

Finally regarding the USA patent 6,081,287 this describes a thermal head and I don't see any contact with our invention."

Since the claims in the case are deemed to be allowable, an early notice to that effect is earnestly solicited.

7. A petition for an automatic one month extension of the term is enclosed together with a PTO-2038 form charging the amount to a credit card of the undersigned.

Respectfully submitted,
The Firm of Karl F. Ross P.C.

By: Herbert Dubno, Reg. No. 19,752
Attorney for Applicant

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5676 Riverdale Avenue Box 900
Bronx, NY 10471-0900
Cust. No.: 535
Tel: (718) 884-6600
Fax: (718) 601-1099

Encls: Copies of Publications
Petition for Extension
PTO-2308 Form